Middle School Teacher and Student Ethnicity in Texas: A MultiYear Statewide Analysis*

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Abstract

In this investigation, relationships between teacher ethnicity and student ethnicity in Texas public middle schools were examined. Through the Texas Education Agency Academic Excellence Indicator System, publicly available data on all public middle schools in Texas for the 1999-2000 through 2009-2010 school years were downloaded. Statistically significant, positive relationships with large effect sizes were yielded between teacher ethnic diversity (i.e., Hispanic, Black, and White) and student ethnic diversity (i.e., Hispanic, Black, and White, respectively) at Texas middle schools. As more Hispanic students were enrolled in a middle school, the tendency was present for more Hispanic teachers to be employed at that school. The same result was yielded for Black teachers and Black students and for White teachers and White students.

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1 Sumario en espanol

En esta investigación, las relaciones entre etnia de maestro y etnia de estudiante en Tejas colegios que públicos fueron revisados. Por la Agencia de la Educación de Tejas Sistema Académico de Indicador de Excelencia, los datos públicamente disponibles en todos los colegios públicos en Tejas para el 1999-2000 por 2009-2010 años de la escuela fueron descargados. Las relaciones estadísticamente significativas y positivas con tamaño grandes de efecto fueron rendidas entre maestro diversidad étnica (es decir, hispano, Negro, y Blanco) y el estudiante diversidad étnica (es decir, hispano, Negro, y Blanco, respectivamente) en colegios de Tejas. Como estudiantes más hispanos fueron matriculados en un colegio, la tendencia fue presente para maestros más hispanos ser empleado en esa escuela. El mismo resultado fue rendido para maestros Negros y estudiantes Negros y para maestros Blancos y estudiantes Blancos.

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2 Introduction

The United States accounts for approximately 4.6% of the entire population of the world (Shrestha, 2006). In the near future, the United States is expected to double in size from its 1950's population of 152 million people to more than 300 million people. Furthermore, by 2050, the U.S. population is estimated to reach nearly 420 million people (Shrestha, 2006). Not only is the population of the United States increasing, it is also becoming more ethnically diverse (Shrestha, 2006). One of the most influential indicators of population growth in the United States is international immigration. Between 1950 and 2050, the United States net immigration rate is projected to be positive, in that the number of people moving to the United States exceeds the number of people moving out of the United States (Shrestha, 2006). In fact, since 2001, nearly 1 million individuals have been permitted into the United States annually under immigrant status; whereas, only about 300,000 individuals emigrate annually from the United States (Shrestha, 2006).

According to the U.S. Census Bureau, four states are no longer considered majority White states, including California, Hawaii, New Mexico, and Texas, which are now referred to by the Bureau as "majority-minority" states (Wright, 2010, p. 11). Furthermore, 30% of the U.S. population are minorities, but by 2050, as many as 50% of the United States population will be minorities (Kotkin, 2010). Additionally, an estimated 11 million undocumented immigrants currently reside in the United States and the number of undocumented immigrants in the United States is expected to increase at a rate of 500,000 individuals a year (Shrestha, 2006).

Both social and economic issues will be tremendously impacted by the shift in demographics of the U.S. population. Consequently, the student population in U.S. public schools will mirror the demographic changes. Similarly, the demographic changes in the United States population can also be seen at the state level. In Texas, the demographic shift has been even more dramatic. In comparison to other states throughout the United States, the economic prospects in Texas are much more favorable, and in turn, large numbers of immigrants have relocated to the state (Petersen & Assanie, 2005).

The Hispanic population has become the largest minority group in Texas (Wright, 2010). In Harris County, Texas, where the city of Houston is located, the Hispanic population grew an estimated 40% from 2000 to 2008 (Wright, 2010). Alternatively, the White population in Harris County, Texas grew less than 1% (Wright, 2010). Historically, Texas has grown at a faster rate than the United States (Combs, 2008). For example, between 1970 and 1980, the population of Texas grew at a rate of 2.71% per year, as a result of the nationwide rising prices of oil (Petersen & Assanie, 2005). During the same decade, the U.S. population grew at a rate of 1.14% per year (Combs, 2008). The rapid growth of Texas can be attributed to the strong

economy in the state, as well as to the booming technology industries near Austin and Dallas (Orrenius, 2004). The state has witnessed an enormous international immigration rate, an increased Hispanic birth rate, and a lowered domestic migration rate (Orrenius, 2004). Consequently, the percentage of the state's population of White people dropped below 50% in 2003 (Petersen & Assanie, 2005).

The Hispanic population is fastest growing ethnic group in Texas (Combs, 2008). Currently, Hispanics make up 35% of the state's population (Combs, 2008). Similarly, the Black population in Texas has grown and now represents 11% of the total population in Texas (Combs, 2008). Furthermore, the percentage of individuals in Texas who are not members of the Black, Hispanic, or White ethnic groups have more than doubled since the 1990's (Petersen & Assanie, 2005). Rapidly changing demographics in Texas will have long term implications for the state. Because of the high birth rate, the population of Texas on average is much younger than in other states. Consequently, major strains on the housing, education, and labor force will arise in the future (Orrenius, 2004).

Furthermore, the major disparities between ethnic groups in Texas will have far reaching implications for the economy of the state (Orrenius, 2004). For instance, Mexican immigrants on average earn 40% lower wages than Texan natives (Petersen & Assanie, 2005). This disparity is, in part, due to the younger ages, less job experience, and lack of English language skills (Combs, 2008). Without considerable changes in the educational system of Texas, the socioeconomic status of the majority of the state's population will continue to rely on the state's social services, draining the finances of the state.

Currently, 25% of children in the U.S. under the age of 5 years are Hispanic, and by 2050, that number will reach closer to 40% (Kotkin, 2010). Similarly, the number of Black children in the United States is growing at a rate just as drastic (Kotkin, 2010). However, the National Center for Education Statistics reported that the percentage of minority teachers in U.S. public schools is not at all representative of the number of minority students in U.S. public schools (NCES, 2003). Nationally, the public school population is made up of 40% minority students; however, only 17% of U.S. public school teachers are minority (NCES, 2004). These percentages have changed rapidly in recent years. For example, in 1972, 22% of students in U.S. public schools were minorities (Louis, 2003). However, as recently as 2002, that percentage had increased to nearly 40%; whereas, 60% of public school students were White, 17% were Black, and 17% were Hispanic (NCES, 2003).

Contrary to the ethnic makeup of the student population, 90% of public school teachers in 2002 were White, only 6% were Black, and even fewer public school teachers were of other races. Alarmingly, as many as 40% of public schools in the United States report having no minority teachers on staff for the 2002 academic year (NCES, 2003). Similarly, states that report having the largest percentages of minority students have the greatest disparity in the percentages of minority teachers. In spite of the rapidly changing demographics of the student population, the NCES (2003) predicted that the percentage of minority teachers in public schools was not expected to increase. In Texas, the need for minority teachers is even more profound (Staudt, 2008). As it stands, more than 40% of the student population in Texas is made up of Hispanic students (Wright, 2010). At the same time, Hispanic teachers only make up about 22% of the teacher population in Texas (Wright, 2010). Implications can be drawn that about half of the Hispanic student population in Texas do not have role models representative of the Hispanic culture.

Furthermore, an average of 18-20% of public school students in the United States are living in poverty, and in some areas, as many as 34% of the students are living in poverty (Louis, 2003). Historically, students in high poverty schools are not as successful on standardized tests as the students in schools that are more affluent. Additionally, students who are economically disadvantaged are less likely to complete high school or to obtain the skills necessary for gainful employment than are students from more affluent backgrounds. For students who are both poverty-stricken and a member of a minority group, high school completion rates are extraordinarily low (Louis, 2003). More often, immigrant students lack adequate resources and have higher mobility rates, more family responsibilities, and parents with limited knowledge regarding educational opportunities (Orrenius, 2004). For instance, Hispanic students who are economically disadvantaged and who were not born in the United States are nearly three times as likely to drop out of school as are first or second generation Hispanic students (Louis, 2003). Specifically, 44% of Hispanic students who are economically disadvantaged drop out of high school (Louis, 2003).

Moreover, the achievement gap between Hispanic andWhite students continues to exist (Hemphill & Vanneman, 2011). As affirmed, in the NCES 2011 statistical analysis report, White students had higher scores than Hispanic students in math and reading from 1990-2009 on the National Assessment of Educational Progress assessments (Hemphill & Vanneman, 2011). Similarly, the achievement gap between Black and White students continues to be present. Once more, as documented in the NCES 2009 statistical analysis report, White students had higher scores than Black students in math and reading assessments (Vanneman, Hamilton, Baldwin, Anderson, & Rahman, 2009).

Overall, the student population in United States public schools has changed dramatically with respect to student diversity. School officials face the challenge of restructuring curricula and instructional strategies so as to be culturally responsive to the needs of a more diverse group of learners. To begin this restructuring, the ethnicity of the teaching staff of U.S. public schools must match the ethnicity of the students enrolled in U.S. public schools.

3 Research Questions

The following research questions were addressed in this investigation:

a. What is the relationship between teacher ethnic diversity (i.e., Hispanic) and student ethnic diversity (i.e., Hispanic) in Texas middle schools for each of the 11 school years from 1999-2000 through 2009-2010?;
b. What is the relationship between teacher ethnic diversity (i.e., Black) and student ethnic diversity (i.e., Black) in Texas middle schools for each of the 11 school years from 1999-2000 through 2009-2010?; and
c. What is the relationship between teacher ethnic diversity (i.e., White) and student ethnic diversity (i.e., White) in Texas middle schools for each of the 11 school years from 1999-2000 through 2009-2010?

4 Method

4.1 Selection Participants

Data from all public middle schools, with the exception of charter schools, in the state of Texas were gathered for the school years 1999-2000 through 2009-2010 using the Academic Excellence Indicator System (AEIS). Through the AEIS database, information is collected on approximately 1,220 public school districts in Texas. For the purposes of this study, the data gathered were on teacher employment at and student enrollment in middle schools. Specifically, data were downloaded regarding Hispanic, Black, and White teacher groups and Hispanic, Black, and White student groups.

4.2 Instrumentation and Procedures

For the purposes of this study, archival data were gathered using the Texas AEIS for the 11 academic years 1999-2000 through 2009-2010. The AEIS is a comprehensive reporting system, which is used to generate reports about campuses, school districts, and the state, and these data are then used to determine accountability ratings (TEA, 2009a). Collected data were used to determine the relationship between the percentage of Hispanic teachers and Hispanic students, the relationship between the percentage of Black teachers and Black students, and the relationship between the percentage of White teachers and White students. Each relationship was analyzed at the middle school level for 11 academic school years.

4.3 Middle School Level

School types are assigned to all campuses within the AEIS database according to the lowest and highest grade levels of the students. For the purposes of this study, middle school referred to a campus at which students in grades 6-8 are enrolled (TEA, 2009b).

5 Results

To address the three research questions that were posed, scatterplots depicting the relationship between teacher ethnic diversity (i.e., Hispanic, Black, and White) and student ethnic diversity (i.e., Hispanic, Black, and White) in Texas public middle schools for each of the school years were generated. No serious departures from linearity were revealed. Therefore, the computation of correlation coefficients was justified. Next, the standardized skewness coefficients (i.e., skewness value divided by its standard error) and standardized kurtosis coefficients (i.e., kurtosis value divided by its standard error) for each of the variables for each of the 11 school years were examined. For all 11 school years, the preponderance of standardized skewness coefficients and standardized kurtosis coefficients were outside the bounds of normality of -3.00 and 3.00 (Onwuegbuzie & Daniel, 2002). Hence, non-parametric correlation coefficients (i.e., Spearman's rank order correlations) were calculated to determine the relationship between teacher ethnic diversity (i.e., Hispanic, Black, and White) and student ethnic diversity (i.e., Hispanic, Black, and White) in Texas public middle schools for each of the 11 school years.

For the 1999-2000 school year, the relationship between Hispanic teachers and Hispanic students was examined. A statistically significant relationship was yielded between the two variables (r [1407] = .71, p < .001). The effect size was large (Cohen, 1988). By squaring the correlation coefficient, an *r2* of .50 was obtained, indicating an overlap of 50% between where Hispanic teachers were employed and where Hispanic students were enrolled in middle school for the 1999-2000 school year. For the same year, the relationship between Black teachers and Black students at the middle school level was examined. A statistically significant relationship was yielded between the two variables (r [1407] = .69, $p < .001$). The effect size was large (Cohen, 1988). By squaring the correlation coefficient, an *r2* of .48 was obtained, indicating an overlap of 48% was present between where Black teachers were employed and where Black students were enrolled in middle school for the 1999-2000 school year. Next, the relationship between White teachers and White students at the middle school level for the 1999-2000 school year was examined. A statistically significant relationship was yielded between the two variables (r [1407] = .82, $p < .001$). The effect size was large (Cohen, 1988). By squaring the correlation coefficient, an *r2* of .67 was obtained, indicating an overlap of 67% between where White teachers were employed and where White students were enrolled in middle school for the 1999-2000 school year.

The same analyses were conducted for Hispanic teachers and for Hispanic students; for Black teachers and for Black students; and for White teachers and for White students for the other 10 school years of data analyzed. With the exception of one year (i.e., 2004-2005) of data, results were remarkably congruent. Data and results for one school year, the 2004-2005 school year, were not congruent with the other 10 school years of data analyzed. This finding parallels that of a recent doctoral dissertation in which Texas secondary school size was analyzed. Greeney (2010) also reported that the data for the 2004-2005 school year were not commensurate with the data for the surrounding school years, although he did not provide any speculations concerning specific reasons for the data anomalies. Even after repeated analyses of the way in which data were coded for the 2004-2005 school year, we were not able to ascertain any reason for the discrepancies between results for the 2004-2005 school year and the other 9 years of data analyzed.

Represented in Table 1 are the correlation coefficients (r), the coefficients of determination ($r2$), and effect sizes for the correlation calculated between Hispanic teachers and Hispanic students in Texas public middle schools for all school years of data examined. With the exception of one school year, the data remained consistent over the 11 school years. Overall, Hispanic middle school teacher employment and Hispanic middle school student enrollment are highly correlated with large degrees of overlap. That is, middle schools with higher percentages of Hispanic students who were enrolled tended to have higher percentages of Hispanic teachers. Similarly, middle schools with higher percentages of Hispanic teachers tended to have higher percentages of Hispanic students who were enrolled. Because these results reflect associations, the tendency also existed for middle schools with lower percentages of Hispanic students to have lower percentages of Hispanic teachers and for middle schools with lower percentages of Hispanic teachers to have lower percentages of Hispanic students.

Table 1

Correlation Coefficients, Coefficients of Determination, and Effect Sizes for Hispanic Teachers and Hispanic Students in Texas Public Middle Schools

School Year	r	r^2	Effect Size
Hispanic Teachers and Hispanic Students			
1999-2000	.71	.50	Large
2000-2001	.72	.52	Large
2001-2002	.74	.55	Large
2002-2003	.73	.53	Large
2003-2004	.69	.48	Large
2004-2005	.23	.05	Small
2005-2006	.72	.52	Large
2006-2007	.74	.55	Large
2007-2008	.74	.55	Large
2008-2009	.76	.58	Large
2009-2010	.78	.61	Large

Depicted in Table 2 are the correlation coefficients (r), the coefficients of determination ($r2$), and effect sizes for the correlation calculated between Black teachers and Black students in Texas public middle schools for all 11 school years of data. As was noted with Hispanic teachers and Hispanic students in middle schools, with the exception of one school year, the data remained consistent over the 11 school years. Overall, Black middle school teacher employment and Black middle school student enrollment were highly correlated with large degrees of overlap. That is, middle schools with higher percentages of Black students who were enrolled tended to have higher percentages of Black teachers. Similarly, middle schools with higher percentages of Black teachers tended to have higher percentages of Black students who were enrolled.

Table 2

Correlation Coefficients, Coefficients of Determination, and Effect Sizes for Black Teachers and Black Students in Texas Public Middle Schools

School Year	r	r^2	Effect Size
Black Teachers and Black Students			
1999-2000	.69	.48	Large
2000-2001	.69	.48	Large
2001-2002	.70	.49	Large
2002-2003	.71	.50	Large
2003-2004	.68	.46	Large
2004-2005	.27	.07	Small
2005-2006	.70	.49	Large
2006-2007	.72	.52	Large
2007-2008	.71	.50	Large
2008-2009	.72	.52	Large
2009-2010	.65	.42	Large

Illustrated in Table 3 are the correlation coefficients (r), the coefficients of determination ($r2$), and effect sizes for the correlations calculated between White teachers and White students in Texas public middle schools for all school years of data examined. As was noted with the two minority groups, with the exception of one school year, the data remained consistent over the 11 school years. Overall, White middle school teacher employment and White middle school student enrollment are highly correlated with large degrees of overlap. That is, middle schools with higher percentages of White students who were enrolled tended to have higher percentages of White teachers. Similarly, middle schools with higher percentages of White teachers tended to have higher percentages of White students who were enrolled.

Table 3

Correlation Coefficients, Coefficients of Determination, and Effect Sizes for White Teachers and White Students in Texas Public Middle Schools

School Year	r	r^2	Effect Size
White Teachers and White Students			
1999-2000	.82	.67	Large
2000-2001	.83	.69	Large
2001-2002	.84	.71	Large
2002-2003	.84	.71	Large
2003-2004	.81	.66	Large
2004-2005	.25	.06	Moderate
2005-2006	.84	.71	Large
2006-2007	.85	.61	Large
2007-2008	.86	.74	Large
2008-2009	.90	.81	Large
2009-2010	.85	.72	Large

6 Discussion

With the exception of one school year, the data examined regarding the relationships between teacher ethnic diversity (i.e., Hispanic, Black, and White) and student ethnic diversity (i.e., Hispanic, Black, and White) in Texas public middle schools remained consistent across the 11 school years included in the study. Strong positive relationships were yielded between where Hispanic students were enrolled in middle schools and where Hispanic teachers were employed in middle schools. Strong relationships were also present between where Black students were enrolled and where Black teachers were employed. As the numbers of Black students enrolled in middle schools increased, the numbers of Black teachers employed at the middle schools increased. The strongest relationship was present between where White students were enrolled in middle schools and where White teachers were employed in middle schools. As such, strong positive relationships were present between teacher and student ethnic diversity in Texas middle schools over the past 11 school years.

We contend that the increase in teachers of color at the middle school level is still lacking when compared to the increase in students of color students at the middle school level. Overall, the relationships between teacher ethnic diversity (i.e., Hispanic, Black, and White) and student ethnic diversity (i.e., Hispanic, Black, and White) in Texas public middle schools did not change much across the 11 school years included in the study. Though we did not examine minority teacher recruitment strategies employed by school districts in Texas, we do not believe that they have been successful at increasing the diversity of the teacher work force and in providing ethnic students with more teachers of their same ethnicity in public middle schools. Research needs to be conducted to ascertain the extent to which our belief is supported empirically.

Minority teacher representation at the middle school level has been documented to have positive impacts on the academic success of middle school students (Villegas & Irvine, 2010). For instance, in middle schools where higher numbers of Black students and higher percentages of Black teachers were present, placement in gifted and talented classes and matriculation to college and vocational schools increased (England & Meier, 1986; Meier, Stewart, & England, 1989). Hanushek (1992) reported that Black middle school teachers

were more successful than White teachers in raising vocabulary and reading scores of Black middle school students. In general, middle school aged minority students have demonstrated academic success in middle schools where a greater representation of minority teachers is present.

Results from this study, however, indicated that progress toward providing a more diverse teaching force for the most part had not occurred in the past 11 schools years. . As a result, we contend that academic opportunities provided to minority students have also been stifled. Therefore, beyond the social motivation for policy change, an examination of the results of this study should invoke changes to policy for the sake of the academic success among minority students. Otherwise, minority students on the whole will not have the same educational opportunities as their non-minority peers.

7 Recommendations for Future Research

Relatively few studies concerning teacher ethnicity and student ethnicity over an extended time period have been conducted. However, given the impact teacher ethnicity and student ethnicity may have on student achievement, it is critical for the topic to be examined from as many perspectives as possible. Because this study represented one of only a few studies on teacher ethnicity and student ethnicity over an extended time period (England & Meier, 1986; Hanushek, 1992; Meier et al., 1989; Villegas & Irvine, 2010), several suggestions for future research will be noted. One of the most vital studies to be recommended for future research is to obtain the necessary data to determine which teachers teach which students. With AEIS data, a determination can be made regarding the percentage of minority teachers, as well as the percentage of minority students. However, the AEIS does not provide the number of ethnic minority students by course assignment. Therefore, it is impossible to determine which teachers are teaching which students. In this study, teacher and student ethnicity were examined on a campus level, rather than on a teacher to student level. Thus, a recommendation for future research is for researchers who have access to student level data to pursue a study of teacher ethnicity and student ethnicity at the student level.

A second suggestion for future research is to compare teacher ethnicity and student ethnicity in Texas charter schools, Texas private schools, and Texas alternative placement schools. Such comparisons would shed light on the equal opportunities for employment in charter, private, and alternative schools. Additionally, studies performed in these settings would most definitely provide some insight into the ethnic achievement gap. Moreover, a study of teacher ethnicity and student ethnicity in Texas alternative schools would add to the existing body of knowledge on the relationship between teacher ethnicity and student ethnicity and referrals to alternative placement schools.

A third suggestion for future research is to expand the scope of this study to include additional decades of academic school years. When greater segments of time are included in a study, researchers may be able to obtain a better idea of the big picture. Furthermore, researchers could examine any connections between a rise in teacher membership to ethnic minority groups and political and social events that coincide with the timing. Results of such a study would provide a way to understand what events have a meaningful impact on minority teacher recruitment. More specifically, school districts could use such a study to determine in which school years they were most successful in helping to recruit minority teachers to their district and to focus on the recruitment strategies in place at that time.

Researchers would have a more robust understanding of the impact on student achievement that having a teacher who possesses similar characteristics as the students might have if this study were replicated among other minority groups. For example, altering this study by examining the gender of teachers at the elementary, middle, and high school levels and by determining the relationship between teacher gender and student gender at the three levels would provide a broader perspective of how students may be impacted by having teachers with similar characteristics as themselves. Such research would also provide feedback to school districts regarding the success of recruitment efforts at the various levels.

Additional suggestions for future research involve adding variables to determine additional relationships. For example, identifying the campuses in which the teacher ethnicity more closely mirrors the student ethnicity, and then determining the level of academic success of the minority students compared to the level of academic success of minority students in schools with fewer minority teachers, would provide for additional

rationale for minority teacher recruitment. Another variation of this study, which is recommended for future research, is to examine the effect of school level on teacher employment, as it relates to teacher ethnicity (i.e., Black, Hispanic, and White). Furthermore, a mixed methods study is recommended in which the minority teacher recruitment practices are examined in schools where the teacher ethnicity more closely mirrors the student ethnicity.

8 Conclusion

Results of this study support the findings of current literature regarding teacher ethnicity and student ethnicity. Furthermore, the results of this study expanded the current body of knowledge by examining teacher ethnicity and student ethnicity by campus at the middle school level for an extended period of time. Documented in the results of this study were positive relationships between where Hispanic teachers were employed and where Hispanic students were enrolled, where Black teachers were employed and where Black students were enrolled, and where White teachers were employed and where White students were enrolled.

The relationship between the employment of Hispanic teachers and enrollment of Hispanic students was stronger than that of Black teachers and Black students. Moreover, the relationship between the employment of White teachers and enrollment of White students was even stronger than that of Hispanic teachers and Hispanic students. Most importantly, the relationships examined in this study remained consistent over the 11 school years. This consistency, in our view, does not reflect well on the financial resources and time devoted to diversifying the teaching force.

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